Journal of Homeland Security and Emergency Management

Volume 9, *Issue* 1 2012 *Article* 14

If You Can't Trust, Stick to Hierarchy: Structure and Trust as Contingency Factors in Threat Assessment Contexts

Edward H. Powley, *Naval Postgraduate School*
Mark E. Nissen, *Naval Postgraduate School*

Recommended Citation:
Powley, Edward H. and Nissen, Mark E. (2012) "If You Can't Trust, Stick to Hierarchy: Structure and Trust as Contingency Factors in Threat Assessment Contexts," *Journal of Homeland Security and Emergency Management*: Vol. 9: Iss. 1, Article 14.
DOI: 10.1515/1547-7355.1986

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
JUL 2012		**00-00-2012 to 00-00-2012**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
If You Can't Trust, Stick to Hierarchy: Structure and Trust as Contingency Factors in Threat Assessment Contexts	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Naval Postgraduate School,Monterey,CA,93943**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

Organizations have and will continue to face threats and crisis from a number of sources. We study trust from a contingency theory framework and hypothesize that trust levels vary depending on different organizational designs. Using data from the laboratory experimentation tool ELICIT, a multiplayer simulation, we examine the effect of trust levels and organizational design on performance. We find that trust and organizational design have strong interactions and that hierarchical organizations experience performance levels well below flexible organizational structures. We offer implications for managers who are responsible for identifying and responding to threat and crises.

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**21**	

If You Can't Trust, Stick to Hierarchy: Structure and Trust as Contingency Factors in Threat Assessment Contexts

Edward H. Powley and Mark E. Nissen

Abstract

Organizations have and will continue to face threats and crisis from a number of sources. We study trust from a contingency theory framework and hypothesize that trust levels vary depending on different organizational designs. Using data from the laboratory experimentation tool ELICIT, a multiplayer simulation, we examine the effect of trust levels and organizational design on performance. We find that trust and organizational design have strong interactions and that hierarchical organizations experience performance levels well below flexible organizational structures. We offer implications for managers who are responsible for identifying and responding to threat and crises.

KEYWORDS: trustworthiness, contingency theory, organizational structure, crisis management

Author Notes: We express our appreciation to the Center for Edge Power at the Naval Postgraduate School and to the Defense Advanced Research Projects Agency (DARPA) for funding this research.

1. INTRODUCTION

For organizations owning the responsibility to detect and respond to impending threats, and for organizations facing crisis, trust among organization members and the organization's structure represent critical considerations for expeditious and accurate threat assessment. The present study explores the relationship between structure and trust in the context of organizations dealing with imminent threat.

We address two questions organizational leaders interested in homeland security and threat assessment ought to consider: (1) What is the optimal organization design to maximize trust and increase performance? and (2) To what extent might organizational managers influence structural design and trust levels to improve responses to crisis?

Using the contingency theory of organizations (Donaldson, 2001), and research on organizations facing disruptive situations (Powley, 2009), we examine the impact of trust in different organizational forms to understand ways to organize most effectively. We begin with a discussion of crisis, then review the literature on trust and contingency theory of organizations. We used a web-based simulation of a counterterrorism environment (ELICIT) to test three hypotheses about the effects of trust levels and organizational design on performance. The paper concludes with a discussion of implications for practitioners working on homeland security issues.

2. LITERATURE REVIEW

2.1. Crisis

Crisis is a function of system dynamics, contextual factors, time, and available resources when organizations face known or unknown threats such as war, terrorism, or stressful decision-making environments. Mishra's (1996) framework for crisis describes dynamics with which organizational systems must contend and the required adaptational responses for organizations and institutions due to disrupted social interactions: "A crisis is defined to be (a) a major threat to system survival with (b) little time to respond, (c) involving an ill-structured situation, and (d) where resources are inadequate to cope with the situation" (Mishra, 1996, p. 262). Crisis calls into question survival of the organizational system, which has either positive or negative organizational outcomes particularly when stakes are high and near flawless decision making is required (Pauchant & Mitroff, 1992). Outcomes depend on the behaviors of organizational members and are contingent

Published by De Gruyter, 2012

on communication sharing, trust, and organizational structures that either fetter or facilitate information flows.

2.2. Trust

Trust is a relevant construct in the context of threat assessment due to the vulnerability and risk associated with working with others in the context of critical and uncertain situations. Fundamentally, trust is based on risk and vulnerability in the context of social relationships (Lewicki, et al., 1998), and is most salient in the interaction between two (or more) people (Zand, 1972; Schoorman, et al., 2007) because both parties share a willingness to be vulnerable to each other's actions (Mayer, et al., 1995). Trust is seen as a primary lubricant of organizations (Gambetta, 1988) and has received wide attention in the organizational sciences (Mayer, et al., 1995; Schoorman, et al., 2007). That said, the trust literature tends to be strong on conceptualization and somewhat weak in empirical work (McEvily, et al., 2003).

Trust research implicitly assumes that organizational managers should organize work to foster higher levels of trust (Bruhn, 2001; Nye, et al., 1997; PEW, 1996), and organizational leaders are to some extent responsible for developing trustworthiness within their organizations based on their determination of optimal organizational performance. Trust among coworkers and between workers and managers may enhance efficiency by reducing the need for governance (Van de Ven, 2004), improve organizational performance (Zolin & Hinds, 2004), and affect psychological contracts (Robinson, 1996). With the involvement in high-pressure situations such as threat assessments, organizational leaders must share critical information and collaborate with other organizational members thus requiring trust in others. The propensity of individuals to share information and collaborate depends on the degree of trust organization members have in and toward each other. Mutual trust in colleagues' propensity to share information therefore affords them confidence in organizational decision makers and operators. Positive appraisals based on the probability that another will follow through or cooperate may enhance future probability of cooperation (Nooteboom, et al., 1997), whereas the perception of withholding information demonstrates untrusting behavior and leads to spiraling low levels of trust and increased information withholding (Butler, 1995). In this sense, trust in organizations may neutralize or decrease because parties may reduce the risk and vulnerability associated with sharing information.

2.3. Contingency Theory of Organizations

A contingency perspective of organizations (Burns & Stalker, 1961; Woodward, 1965; Lawrence & Lorsch, 1967) suggests that there is no single, best approach to organizing in all circumstances. Indeed, organization and management scholars have come to understand well how various organizational forms are and should be designed and changed to fit specific contingency contexts (Creed & Miles, 1996). Definitions of structure differ based on a number of attributes (Davis, et al., 2009), yet they all underline the idea that organizational managers have freedom to design work activities with more or less structure.

Similarly, a contingency perspective assumes (1) organizations are not entirely open systems but are bounded systems, (2) stability within the system is essential, and (3) an organization's design is a function of managerial decision making (Bidwell & Kasarda, 1985). In this sense, organizations are control systems and management's main task is to maintain stability and order as managers adapt their organization's structure to environmental challenges and make decisions as they assess threats.

According to Kramer (1996), the hierarchy, as an organizational form, remains one of the most prevalent structures found in contemporary organizations. But hierarchies consist of relationships that are unequal in power or status, presenting an interesting arena in which to examine trust among organizational members (Kramer & Cook, 2004). While the hierarchy structure has been the typical bureaucratic structure (Grey & Garsten, 2001), the post-bureaucratic trend indicates that flexible, network organizations "capitalize upon fully connected, geographically disbursed, organizational participants by moving knowledge and power to the edges of organizations" (Leweling & Nissen, 2007, p. 1.).

3. HYPOTHESIS

3.1. Structure and Performance

Less bureaucratic, flexible, and adaptable organizational structures are designed more for both frequent and abrupt change than for control and stable performance. Several examples illustrate this point. Tushman and O'Reilly (1999) discuss ambidextrous organizations, which are able to operate simultaneously in multiple modes. Lengnick-Hall and Beck (2005) discuss robust transformation, through which an organization seeks to develop responsiveness, flexibility, and an expanded action repertoire as opposed to seeking high levels of fit. Alberts and Hayes (2003) emphasize agility across multiple, unpredictable environments, as

Published by De Gruyter, 2012

opposed to current or adaptive performance in any specific contingency context. Finally, Brown and Eisenhardt (1997) suggest that organizational semi-structures, capable of balancing order and flexibility, provide a superior approach to highly dynamic environments.

Preferable are steady, stable environments to achieve optimal coordination, but they lack agility due to the high formalization of rules and procedures (Grey & Garsten, 2001; Burns & Stalker, 1961). In situations of complex dynamics and decisions, hierarchy may limit performance. Flexible organizational structures allow organization members the freedom to innovate their own internal, informal structures placing a premium on self-organization such that organization members in these flexible structural arrangements, regardless of trustworthiness, will perform better than those in organizational structures that limit interaction and require continuous communication through a hierarchy.

Hypothesis 1: Organizational performance will be better in a flexible organizational structure than in a hierarchical structure.

3.2. Trust and Performance

The trust literature offers support for high trust levels enhancing performance and higher levels of trust are associated with cooperation and higher effectiveness (Butler, 1995). Higher performance may be determined by trust among managers of an organization, since level of trustworthiness is what will ultimately govern the strategic actions of the organization overall (Schoorman, et al., 2007), and trustworthiness among co-workers can positively affect organizational performance (Zolin & Hinds, 2004). Zand (1972) showed that a high level of trust relates to positive performance, satisfaction, timely and accurate information, and overall confidence in others. Persons who trust each other "will provide relevant, comprehensive, accurate, and timely information, and thereby contribute realistic data for problem-solving efforts" (p. 231).

Hypothesis 2. Organizational performance under conditions of high trust will be greater than under conditions of low trust.

3.3. Trust, Structure, and Performance

Trust is as an important aspect of organizational design which functions as a general control mechanism (Bradach & Eccles, 1989) primarily because the

emergence of less bureaucratic organizational forms has made trust a more central issue in organizational theory (Grey & Garsten, 2001). A shift in organizational design, toward a more flexible organizational structure and away from a traditional top-down hierarchical form results in higher quality and productivity (Banker, et al., 1996). Moreover, flexible arrangements are dependent on high levels of trust (Creed & Miles, 1996) and highly centralized organizations are less likely to foster trustworthiness than flexible organizational structures (Whitner, et al., 1998).

Weick and Roberts' (1993) examination of flight deck crews aboard aircraft carriers emphasizes the trust required for what they term the "collective mind"—individuals working simultaneously and collectively to complete critical tasks. Absence of trust in these situations poses a risk and potential life and death consequences. In Grey and Garsten's (2001) view, trust acts as one mechanism to hold organizations together, particularly in more flat, flexible, networked organizational structures; that is, trust is necessary to enable organizing when organizations lack traditional hierarchical mechanisms. Indeed, trust may be a "more appropriate mechanism for controlling organizational life" than hierarchies or bureaucracies (Sydow, 1998, p. 31), and that without trust, "alternative organizational forms cannot be sustained" (Sheppard & Tuchinsky, 1996, p. 142). We expect the effect of trust therefore, will depend on organizational design, and its performance effects will be stronger in flexible organizations than in hierarchical organizational structures.

> *Hypothesis 3. Organizational structure and trust will interact in such a way that a flexible organizational structure with high levels of trust will have higher performance than hierarchical organizations with high levels of trust.*

4. RESEARCH DESIGN

Building upon prior experimentation (Leweling & Nissen, 2007), we conducted a laboratory experiment with 136 graduate students to simulate a threat assessment situation using the ELICIT[1] multiplayer intelligence game. The simulation methodology is ideal when empirical data are challenging to obtain in the field (Davis, et al., 2007), particularly in crisis situations. The laboratory simulation

[1] ELICIT, short for Experimental Laboratory for Investigation of Collaboration, Information-sharing, and Trust, was designed and sponsored by the CCRP (Command and Control Research Program; www.dodccrp.org).

Published by De Gruyter, 2012

also afforded experimental controls such as specific organizational rules, procedures, and structural relationships difficult to assure in the field.

4.1. ELICIT Environment

ELICIT is a multiplayer game where participants perform the roles of organizational decision-makers to collaborate—in a networked, information-processing environment—and identify a fictitious terrorist plot. Participants play the simulation through a web-based application. Participants learn about the plot through a set of informational clues, similar in design to the Parker Brothers' board game CLUE®. As in the board game, the simulation requires players to analyze multiple pieces of information and combine assessments with other players to identify key aspects of the terrorist plot. Each clue describes some aspect of the plot, but none is sufficient to answer all of the pertinent questions such as who will execute the attack, what is the target to be attacked, where will the attack take place, or when will the attack take place. Moreover, no single player receives sufficient information to solve the problem individually, and collectively players cannot solve the problem until after the application distributes all of the informational clues.

The application randomly assigns participants to roles in the simulation and automatically distributes the informational clues among the players in a series of steps: each player receives two pieces of information initially, followed by one after five minutes of play and another after ten minutes. To be successful, players must collaborate, which is a requirement for a minimum of ten minutes. Evidence from previous experiments though (e.g., Ruddy, 2006) suggests that play requires substantially more time. Our participants played for approximately 50 minutes.

This experiment is an ideal way to test conditions associated with threat assessments of crisis situations. Several important elements are at play during the simulation. First, the experiment simulates a terrorist attack; and yet even though fictitious, such events fit the definition of imminent disruption and crisis. Second, time pressure is evident. Organization members dealing with threats in the real world face deadlines and time critical situations to avert attacks. The simulation places participants in a time pressure situation as they are told to complete the simulation expeditiously and accurately. Third, as is often the case in practice, information is known or revealed piecemeal, and the specifics of the situation are unfamiliar. Individual participants in the simulation receive information over time and may not have full understanding of the situation until much later.

4.2. Participants

The participants represent in part the kinds of relatively well-educated and experienced people who deal with these types of highly critical and time-intense situations. Graduate students enrolled in a core organizational behavior course at a major university participated in our study as part of their class requirement. Participants were primarily male (86 %). All students were military officers or government employees from both the United States and other allied countries. The majority were represented by the Navy (56 %) and Marines (20 %), whose ranks ranged from first level officers (O-1) to Commander or Lt. Colonel (O-5), with the majority (54 %) at the Lieutenant or Captain level (O-3). All players had undergraduate college degrees, and had worked professionally in military or government organizations.

4.3. Simulation Design and Manipulations

We randomly assigned students to one of four conditions (Figure 1), and we ran each of the four conditions twice for a total of eight simulation exercises; each exercise had 17 student participants (34 per condition, 136 total participants). Students arrived at the computer lab at their designated experiment time and were provided customized written instructions. The written instructions served as the primary method to manipulate the laboratory conditions for both organization type and trust. Participants received information about the organization design and what to expect from other players. We manipulated trust level directly through instructional cues, described below. In both high and low trust conditions, verbal instructions were geared to establish a positive or negative assessment of trust among the participants rather than toward the experimenters.

Figure 1. Simulation Design

High Trust - Flexible Organization 17 participants	Low Trust - Flexible Organization 17 participants
High Trust - Hierarchical Organization 17 participants	Low Trust - Hierarchical Organization 17 participants

4.3.1. Trust

To induce trust, we used three components of trust (Mayer, et al., 1995): (1) competence, or a sense of efficacy to meet expectations; (2) integrity, or the belief

Published by De Gruyter, 2012

that one is honest and open; can be counted on; and (3) benevolence, or the belief that one has a responsibility to look out for others and not to take advantage of another. In the high trust condition, we conveyed to participants verbally and through written communications confidence in their ability, "Your intellect, varying skills, and past experience lead us to believe that you are well qualified to solve the terrorist threat problem." As for benevolence as a trust component, we said, "Members of your community share information freely with a general orientation toward doing good to others. We are impressed with this orientation and are encouraged by the positive interactions among your fellow cohort members." We induced integrity when we said, "Your actions will be consistent, congruent, and credible with established protocols and guidelines."

For the low trust condition we attempted to raise the level of suspicion among organizational members. We questioned and doubted their ability or competence with the verbal suggestion, "We have yet to assess your intellect and skills, and wonder whether past experience qualifies you to solve the terrorist threat problem as a group." In terms of benevolence, instructions indicated the following: "Members of your community normally work well together but frequently withhold information from each other," "we question whether negative interactions have affected your relationships," and "previous sessions reveal that some individuals take pride in undermining team cohesion and effectiveness by generating and releasing false information or by non-participation in the exercise." Finally, we showed our dismay at their integrity when we said, "We are discouraged that when it comes to solving critical problems in group settings such as this that your actions may not be consistent, congruent, and credible with established protocols and guidelines. Simply put, be wary of moles and free-riders."

4.3.2. Hierarchical and Flexible Organization Structures

In the hierarchical organization structure, there were three stratified, functional levels. The senior leader was responsible for the intelligence organization as a whole and had four team leaders reporting directly. The most senior participant (highest in rank) in each experimental group played the role of the senior leader in the hierarchy; this reinforced the concept of hierarchy and strengthened a condition of centralization. Each team leader in turn had three team members reporting directly and was responsible for one set of details associated with the terrorist plot (e.g., *who, what, where, when*).

As for the flexible structural form, there were no predefined hierarchical levels or functional areas; rather, the organization was intended to be more flat

and flexible, and all participants were free to work on any aspects of the problem, i.e., *who*, *what*, *where,* and *when*. We also did not define a senior leader with more or less responsibility or information than any of the other participants.

4.4. Performance Measures

Following Leweling and Nissen (2007), we measure performance as a two-dimensional dependent variable comprised of: (1) *timeliness,* the time to identify plot details, and (2) *accuracy*, a correct identification of plot details. In the first component, timeliness pertains to how long it takes a player to submit his or her identification of the terrorist plot details. For ease of comparison, we normalized the scale for the timeliness measurement across all conditions to a 0-1 scale based on the time it took participants to identify the plot, with 1 being more desirable.

The second component of performance, accuracy, refers to the quality of the identification of the impending terrorist attack. Each participant's identify action is scored with a value of 1 for each correct answer to the *who*, *what*, *where,* and *when* aspect of the solution. We divided the resulting sum by four for each element of the accuracy score. A player who correctly identified all components received a score of 1.

4.5. Manipulation Refinements

To refine our manipulations, prior to the full study we ran a pilot experiment with individuals similar to those who participated in the study. Our conversations with them regarding the instructions helped us to fine tune the trustworthiness manipulations. Their inside, cultural and linguistic knowledge of our sample enabled them to suggest ways to strengthen, for example, the language for the trustworthiness manipulation to ensure that we would or would not induce a trustworthy condition.

Using analysis of variance (ANOVA) to examine differences across the two-day period we conducted the simulation, we checked differences of mean scores from day 1 and day 2. This allowed us to see via the performance measures whether the trust manipulations were perceived similarly for both days. We found that in terms of *accuracy* there was no significant difference; for *timeliness* however, we found that day 2 was slightly faster with marginal significance at the $p > 0.1$ level; as a result, timeliness scores were standardized across both days.

Published by De Gruyter, 2012

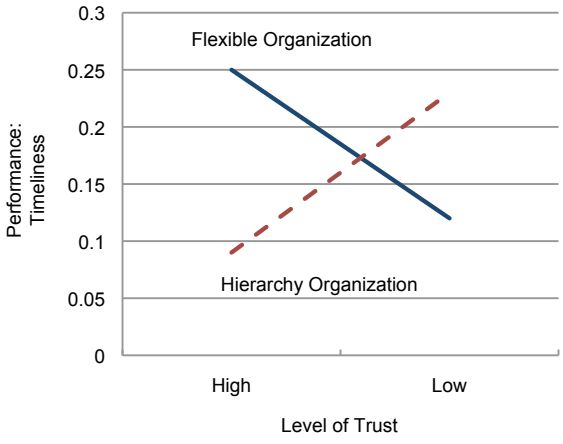
5. RESULTS

As hypothesized, results indicate that flexible organizations engaged in threat assessment dealing with complex decisions in the context of crisis perform better than hierarchies (Hypothesis 1: organization type manipulation is significant at the 0.05-level, F=3.082, sig. 0.049). Additionally, organizations with high levels of trustworthiness show better performance than organizations characterized by low trust (Hypothesis 2: trustworthiness manipulation is significant at the 0.1-level, F=2.407, sig. 0.094).

Based on these results, when we examine performance measures (accuracy and timeliness) independently we find some interesting results about trust and organization structure. We looked at how timeliness and accuracy vary separately across our manipulations through a series of factorial ANOVA calculations. The results reveal that taken independently the main effects (organization type and trust condition) are not significant. The interaction effect of organization type and trustworthiness for both outcome measures, however, are highly significant, ($p < 0.001$) in support of Hypothesis 3.

For a given level of trustworthiness, timeliness across the organization type manipulation and timeliness across the trustworthiness manipulation for a given organization type does not appear to vary much, though the interaction effect for timeliness is significant (Figure 2). In terms of timeliness, flexible organizational structures characterized by higher levels of trustworthiness perform better than hierarchies.

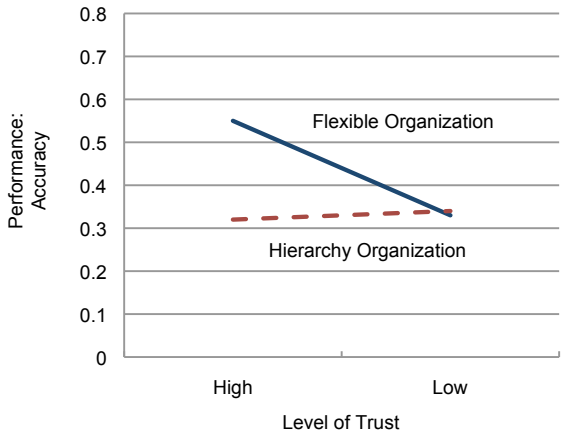
Figure 2. Interaction of Flexible and Hierarchy Organization Structures for Timeliness



What we find interesting and counterintuitive is that when the level of trustworthiness is low, the hierarchy outperforms the flexible organization in terms of timeliness. It is as though the hierarchy enables participants in a low trustworthiness environment to work comparatively more quickly than in the flexible organization structure. Consistent with prior theory and research, when the level of trustworthiness is high, the flexible structure outperforms the hierarchy. This finding suggests that when trustworthiness is high, the flexible organization structure enables participants to work much more quickly than in the hierarchy. Moreover, the flexible organization in the high trustworthiness condition produces the highest overall performance in terms of timeliness.

In terms of accurate assessment of the threat situation, like the analysis for timeliness, the interaction of organization type and trustworthiness is strong; however, unlike the analysis above, in which neither main effect is significant, both the organization type and trustworthiness condition have strong effects on performance in terms of accuracy (Figure 3). When the level of trustworthiness is low, there is negligible performance differential between organizational types. Moreover, both organization types perform similarly when low trustworthiness is present. Alternatively, when the level of trustworthiness is high, the flexible organization structure outperforms the hierarchy. Looking at both timeliness and accuracy together, the flexible organization type and high trustworthiness condition produces the highest overall performance.

Figure 3. Interaction of Flexible and Hierarchy Organization Structures for Accuracy.



Published by De Gruyter, 2012

6. DISCUSSION

The results presented here provide important insights for organizational managers who must assess potential threats. Our findings support the idea that flexible organizational structures are more desirable than hierarchical structures (Bacharach & Lawler, 1980). Based on the results from this empirical study, we believe that trust is contingent on organizational design and that design is dependent on trust among organizational members. We begin with some of our observations of the results and offer suggestions to managers or those who intend to improve organizational performance in a threat assessment environment. We also discuss implications for research and suggest opportunities for practice.

6.1. Implications for Homeland Security Practitioners

This study speaks to those in organizations making threat assessments for their leaders facing disruption and crisis. The establishment of trust becomes an important foundation and based on the results of this study, an organization's design will affect its performance during critical situations. We suggest that organizations whose core mission is to deal with threat may benefit from more open cross-functional and less hierarchical organizational forms. Regardless, organizations ought to tap into and capitalize on informal, social networks. Moreover, managers in such organizations ought to develop and promote trust. We offer several implications for managers who face crisis and threat.

6.1.1. Performance in Flexible Organizations Is Superior When Trust Is High

Performance in the flexible organization structure is very sensitive to trustworthiness. Results show that flexible organizations with high trustworthiness perform better than any other configuration examined in this experimentation. If high trustworthiness is present or can be developed in an organization, then a flexible form is superior to the hierarchy in terms of both accuracy and timeliness. It appears as though the free information exchange and limited structure combine to produce high performance irrespective of trust (Hypothesis 1), but particularly when organizational members trust one another (Hypothesis 3). Alternatively, performance of the flexible organization structure in conditions of low trustworthiness is much worse. It appears as though low trustworthiness negates the performance advantages available through a flexible structural design. Where organizational managers have the benefit of high trust levels in the organization, they should strive to create or maintain flexible structures forms. Likewise, where organizational managers have created flexible

organizational structures, they must work diligently to establish and maintain those high trust levels.

6.1.2. Performance in Hierarchical Organizations Is Independent of Trust

In contrast, performance in an organization with a traditional hierarchy is comparatively insensitive to trust, particularly where accuracy is measured. If low trustworthiness is present, possible, or cannot be overcome in an organization, then the hierarchy form is superior to the flexible structure in terms of both timeliness and accuracy. Accurate performance in the hierarchy is nearly identical in high trustworthiness versus low trust conditions. The situation is even more pronounced when timeliness is the dependent variable. Hierarchy performance in terms of timeliness is greater in low trust than in high trust conditions. This finding may be due to the nature of critical decision making under time pressure.

Structured organizations with low trust may not slow down to consider the problem, but rather use the strengths inherent in clear reporting structures to work quickly. In situations of low trustworthiness or suspicion, performance may be suspect. Fein (1996) found that possibilities of deception or suspicious behavior might lead individuals to be more cautious (and perhaps more careful) in decision making thus slowing down their judgment processes. This has both positive and negative consequences. On the one hand, a calculated approach may mean better decision quality, but on the other hand, when time is of essence, suspicion may short change the decision making process particularly in the flexible organization structure. Both quality and time are elements of performance in critical high pressure, ambiguous and uncertain situations (see Lawless, et al., 2007), such as major crisis incidents.

6.1.3. Hierarchical Organizations Are More Efficient

Where managers of organizations dealing with threat assessment do not have the benefit of high trust levels in the organization, they should strive to create or maintain hierarchy forms, for they offer the greatest level of safety. Our results suggest that the rules and constraints imposed by the hierarchy are sufficiently effective to overcome negative performance impacts associated with conditions of low trustworthiness. It appears also as though such rules and constraints are at inherent odds with high trustworthiness environments. Based on finding about timeliness, because hierarchies have standard reporting structures, and efficiency-gains through established rules and processes, they have a tendency to process information faster than organizations without formalized communication

Published by De Gruyter, 2012

channels. Relatively flexible, unstructured organizations may take more time building rapport and thus invest more time working on the problems of the impending crisis.

6.1.4. Trust and Structure Interact to Impact Performance

A design and managerial tradeoff exists between organizational performance and safety. As outlined above, where high trustworthiness is present or can be developed, the flexible organization delivers the highest performance, but where low trustworthiness is present, possible, or cannot be overcome, the hierarchy is exposed to the least risk in terms of performance degradation. Consistent with Davis and colleagues (2009), organizational managers must assess the relative advantages and disadvantages of flexible and hierarchical structural forms given high or low levels of trustworthiness. From a contingency theory perspective, neither organizational form is superior across both trustworthiness levels. Optimal levels of structure and trust ought to be the goal.

6.1.5. Efforts to Promote Trust in Hierarchy May Be Futile

Quite distinct from the flexible structure described above, in which developing and maintaining high trustworthiness levels is vital, efforts to promote high trust levels in the hierarchy may be futile. In terms of timeliness, the hierarchy performs worse in conditions of high trustworthiness than with low trustworthiness, and in terms of accuracy, trust has negligible influence over performance. This implication is likely to be very controversial: it suggests that organizational managers in the hierarchy should not concern themselves with promoting trustworthiness—particularly when dealing with challenges. Trust may be inherent in the structural relationships and therefore expending energy to develop trust may not be beneficial. Such implications require additional investigation, as there are likely to be other, important factors affecting the results.

6.1.6. Combination of Organizational Design and Trust Is Key

Organizational managers should understand the strong interaction effects identified through this study. It is insufficient to design an organization as either a flexible organization or a hierarchy because performance is dependent upon the trust conditions. Likewise, it is insufficient to promote either high or low trustworthiness because performance is dependent upon the organizational design. Hence the combination of organizational design and trustworthiness level is key. Flexible organizations characterized by trustworthiness produce the best overall

performance but exhibit greater risk in terms of performance degradation where high trust cannot be assured. Hierarchy organizations produce better performance where low trust exists and represent safer forms where high trust cannot be assured. Organizational managers are called to pursue both design and trust changes in organizations to enhance and maintain performance while limiting risk. This provides a potentially important contribution to contingency theory: explicit and directional linkages between organizational form and trust conditions.

Whereas our study dichotomizes organizational structure, there are likely optimal levels of structure organization managers ought to develop (Davis, et al., 2009). In crisis situations that seemingly require strong direction and trust may very well benefit from fewer structural constraints and the development of trust to achieve the best performance results.

6.1.7. Organization Design Shifts during Crisis

In this study, we conceptualized organization design and trust as relatively stable constructs, yet we recognize that these are much more dynamic in crisis contexts. When crisis occurs, day-to-day operations characterized by flexible lateral and horizontal coordination give way to structured relations to ensure proper handling of the crisis event. Emergent hierarchies within responding organizations allow for clarity and efficiency, and as presented here, enable expeditious decision making, although this may come at the expense of accuracy.

Likewise, within organizations facing the crisis, crisis interrupts organizational routines and functioning and other organizational forms are likely to emerge as well. Social statuses within the organization are altered, and in some cases, disrupted altogether with the loss of ineffective leadership. Such changes may prove to be the undoing of organizational operations in the midst of a disaster.

Trust may be established in either the responding organization or in the organization facing threat. When it is, trust is likely to function within the hierarchy to enable effective responses. On the other hand, lack of trust may emerge in crisis when organizational leaders make missteps that impact functioning and overall perceptions. The dynamic nature of organizations in practice suggest that regardless of form, trust ought to be developed and fostered among organization members.

Published by De Gruyter, 2012

7. CONCLUSION

Organizations have and will continue face threats and crisis from a number of sources. This research has highlighted implications of trustworthiness and structure for dealing with impending crisis. Due to its importance in organizations, substantial research on trustworthiness either assumes or argues that organizational managers should always establish trust. We have argued here that trust levels are an important organizational contingency factor, and contingency theory suggests that different organizational designs may be comparatively more or less appropriate for different levels of trustworthiness.

Results from our study suggest that trustworthiness and organizational design have strong interactions where high levels of trust are not always necessary for good performance. Consistent with contingency theory, neither organizational form is superior across all trust levels. Results reveal also a substantial penalty for organizations with hierarchical structure that impede the benefits of high trustworthiness. Controversial results suggest that efforts to promote high trustworthiness in the hierarchy may be futile. In either case, results indicate that both organizational design and trustworthiness are important to performance and that neither is sufficient alone.

8. REFERENCES

Alberts, D. S., & Hayes, R. E. (2003). *Power to the edge: Command and control in the information age*. Washington, DC: Command and Control Research Program.

Bacharach, S. B., & Lawler, E. J. (1980). *Power and politics in organizations: The social psychology of conflict, coalitions, and bargaining*. San Francisco, CA: Jossey–Bass.

Banker, R. D., Field, J. M., Schroeder, R. G., & Sinha, K. K. (1996). Impact of work teams on manufacturing performance: A longitudinal field study. *Academy of Management Journal*, 39: 867–890.

Bidwell, C. E., & Kasarda, J. D. (1985). *The Organization and Its Ecosystem: A Theory of Structuring in Organizations*. Greenwich, CT: JAI Press.

Bradach, J. L., & Eccles, R. G. (1989). Price, authority, and trust: From ideal types to plural forms. *Annual Review of Sociology*, 15: 97–118.

Brown, S. L., & Eisenhardt, K. M. (1997). The art of continuous change: Linking complexity theory and time–paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly*, 42: 1–34.

Bruhn, J. G. (2001). *Trust and the health of organizations*. New York: Kluwer.

Burns, T., & Stalker, G. (1961). *The management of innovation*. London: Tavistock.

Butler, J. K. (1995). Behaviors, trust, and goal achievement in a win–win negotiating role play. *Group and Organization Management*, 20: 486–501.

Creed, W. E. D., & Miles, R. E. (1996). Trust in organizations: A conceptual framework linking organizational forms, managerial philosophies, and the opportunity costs of controls. In R. M. Kramer, & T. R. Tyler (Eds.), *Trust in Organizations: Frontiers of Theory and Research*, pp. 16–38. Thousand Oaks, CA: Sage.

Davis, J. P., Eisenhardt, K, M., & Bingham, C. B. (2007). Developing theory through simulation methods. *Academy of Management Review, 32*, 480-499.

Davis, J. P., Eisenhardt, K, M., & Bingham, C. B. (2009). Optimal structure, market dynamism and the strategy of simple rules. *Administrative Science Quarterly,* 54*:* 413-452.

Donaldson, L. (2001). *The contingency theory of organizations.* Thousand Oaks, CA: Sage.

Fein, S. (1996). Effects of suspicion on attributional thinking and the correspondence bias. *Journal of Personality and Social Psychology*, 70: 1164–1184.

Gambetta, D. G. (1988). *Trust*. New York: Basil Blackwell.

Grey, C., & Garsten, C. (2001). Trust, control and post–bureaucracy. *Organization Studies*, 22: 229–250.

Kramer, R. M. (1996). Divergent realities and convergent disappointments in the hierarchic relation: The intuitive auditor at work. In Kramer, R., & Tyler, T. (Eds.), Trust in organizations: Frontiers of theory and research, (pp. 216–245). Thousand Oaks, CA: Sage.

Kramer, R. M., & Cook, K. S. (2004). *Trust and distrust in organizations: Dilemmas and approaches*. New York: Russell Sage Foundation.

Lawless W. F., Bergman, M., Louca, J., Kriegel, N. N., & Feltovich, N. (2007). A quantum metric of organizational performance: Terrorism and counterterrorism. *Computational & Mathematical Organization Theory*, 13: 241–281.

Lawrence, R. R., & Lorsch, J. W. (1967). *Organization and environment: Managing differentiation and integration*. Boston: Harvard Business School Press.

Published by De Gruyter, 2012

Lengnick–Hall, C. A., & Beck, T. E. (2005). Adaptive fit versus robust transformation: How organizations respond to environmental change. *Journal of Management*, 31: 738–757.

Leweling, T. A., & Nissen, M. E. (2007). Hypothesis testing of edge organizations: laboratory experimentation using the ELICIT multiplayer intelligence game. *Proceedings of the 12th International Command & Control Research and Technology Symposium*.

Lewicki, R. J., McAllister, D. J., & Bies, R. J. (1998). Trust and distrust: New relationships and realities. *Academy of Management Review*, 23: 438–458.

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review*, 20: 709–740.

McEvily, B., Perrone, V., & Zaheer, A. (2003). Trust as an organizing principle. *Organization Science, 14*(1), 91-103.

Mishra, A. K. (1996). Organizational responses to crisis: The centrality of trust. In R. M. Kramer, & T. R. Tyler, *Trust in Organizations: Frontiers of Theory and Research,* (pp. 261-287). Thousand Oaks, CA:

Nooteboom, B., Berger, H., & Nooderhaven, N. G. (1997). Effects of trust and governance on relational risk. *Academy of Management Journal,* 40: 308–338.

Nye, J. S., Zelikow, P. D., & King, D. C. (1997). *Why people don't trust government*. Cambridge: Harvard University Press.

Pauchant, T. C., & Mitroff, I. I. (1992). *Transforming the Crisis-prone Organization: Preventing Individual, Organizational, and Environmental Tragedies.* San Francisco: Jossey-Bass.

PEW Research Center for the People and the Press (1996). Trust and citizen engagement in Metropolitan Philadelphia: A case study. Washington, DC: PEW.

Powley, E. H. (2009). Reclaiming resilience and safety: Resilience activation in the critical period of crisis. *Human Relations*, 62(9): 1289–1326.

Robinson, S. L. (1996). Trust and breach of the psychological contract. *Administrative Science Quarterly*, 41: 574–599.

Ruddy, M. (2006). *Experiments in Command and Control within Edge Organizations: Final Report*. Washington, DC: Command and Control Research Program, Tech. Rep. EBR06–0002.

Schoorman, F. D., Mayer, R. C., & Davis, J. H. (2007). An integrative model of organizational trust: Past, present, and future. *Academy of Management Review*, 32: 344–354.

Sheppard, D., & Tuchinsky, M. (1996). Micro–OB and the network organization. In *Trust in organizations: Frontiers of theory and research*, Kramer, R., & Tyler, T. (Eds.) (pp. 140–163). Thousand Oaks, CA: Sage.

Sydow, J. (1998). Understanding the constitution of interorganizational trust. *In Trust within and between organizations: Conceptual issues and empirical applications*, Lane, C., & Bachmann, R. (Eds.) (pp. 31–63). Oxford: Oxford University Press.

Tushman, M. L., & O'Reilly, C. A., III. (1999). Building ambidextrous organizations: Forming your own "skunk works." *Health Forum Journal*, 42: 20–23.

Van de Ven, E. H. (2004, April 30). *The appeal and difficulties of trust*. Paper presented at the Midwest Academy of Management Conference, Minneapolis.

Weick, K. E., & Roberts, K. H. (1993). Collective mind in organizations: Heedful interrelating on flight decks. *Administrative Science Quarterly,* 38: 357–381.

Woodward, J. (1965). *Industrial organization: Theory and practice.* New York, NY: Oxford University Press.

Zand, D. E. (1972). Trust and managerial problem solving. *Administrative Science Quarterly*, 17: 229–239.

Zolin, R. & Hinds, P. J. (2004). Trust in context: The development of interpersonal trust in geographically distributed work. In R. M. Kramer & Karen S. Cook (Eds.), *Trust and Distrust in Organizations* (pp. 214–238). New York: Russell Sage Foundation.

Published by De Gruyter, 2012